Haier SERVICE MANUAL

Order No. Ref1104S002V0

Refrigerator

MODEL: HFD647AS
HB21TSSAA

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It dose not contain warnings and cautions to advice non-technical individuals of potential dangers in attempting to service a product. Product powered by electricity should by serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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Haier Group

Contents

Table of Contents ····· 1

1. General Information ····· 4

1-1. General guideline 4

1-2. Insurance test 4

1-3. How to read this Service Manual 5

2. Product Feature ····· 6

2-1. Specifications 6

2-2. Main Functions 7

2-3. External views 8

2-4.How to use the crisper 9

2-5.How to use the Delicatessen drawer 9

3. Disassembly ····· 10

3-1. Installing the Door Handle 10

3-2. Installing and Removing Door 12

3-3. Removing and installing Lower Freezer Drawer (If required) ····· 13

3-4. Water line installation 14

3-5. Kick plate installation 15

3-6. Height-adjustable shelf 15

3-7. Removing Crisper Cover 16

3-8.Replacing the light bulb (Refrigerator) 16

4. Control and display system ····· 17

4-1. Control display board 17

4-2. Artificial intelligence setting 17

4-3. Locking / Unlocking setting 17

4-4. Quick freezing setting 17

4-5.Quick refrigerating setting 18

4-6. Switch off ice-maker 18

4-7. Quick ice-making function 18

4-8.Te mperature setting and adjustment 19

4-9. Door-open warning 19
4-10. Energy saving display 19
4-11.Power off memory 19
4-12. Time adjustment and display 19
4-13. Ambient temperature display 19
5. Control principle and related test functions 20
5-1. Air Damper 20
5-2. Control principle of fan motor 20
5-3. Defrost control principle 20
5-4. Ice- making process 21
5-5. Self-testing Function 22
5-6. Ice-maker Inspection Mode 23
6. System flow principle 24
6-1. System flow scenograph 24
6-2. System flow chart 24
7. Circuit diagram 25
7-1. Main control PCB diagram 25
7-2. Brief principle diagram 27
7-3.Sensor and error code 28
7-4. Display Error Codes Information 28
8. Water line map 29
8-1.Th e water line sketch map 29
8-2.Water line scenograph 30
8-3. Water inlet quantity setting (HFD647A*) 30
9. Trouble shooting 31
9-1.Frequently problems 31

Chapter 1 General Information

1-1. General Guidelines

When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1) Leakage Current Cold Check
2) Leakage Current Hot Check
3) Prevention of Electro Static Discharge (ESD) to Electrostatic Sensitive

1-2. Insurance test

1. Check if there is any leak of current.
2. Cut out the power supply before the repair to avoid an electrical shock hazard.
3. In the case of a live-line test, insulating gloves should be worn to avoid potential electrical shock.
4. Confirm the rated current, voltage and capacity before testing with any kinds of instruments.
5. Watch if the upper door is open when you check something at a lower position.
6. Take out every part in the cabinet before moving the machine, especially things like panels (e.g. glass shelf).
7. Please wear intact cotton gloves when repair any parts of the evaporator, so that scratches by the sharp finscan be avoided.
8. If there is a breakdown with the refrigeration system, please surrender the machine to the service center, else the leaked refrigerant may pollute the atmosphere.
9. The refrigerator use AC of 220V with a frequency of 50Hz.
10. A big fluctuation of voltage (exceed the range 187～242V) may cause a start failure of the refrigerator, a burn-out of the control panel and compressor, or an abnormal sound from the compressor in operation. In this condition an automatic voltage regulator over 750W should be added.
11. Take care not to damage the supply line. Don't yank at the line; pull the plug out gently from the receptacle. Don't press the line under the cabinet or step on it. Take care not to roll on or damage the supply line when moves the machine from the wall.
12. In the case of leakage of inflammable gases like carbon monoxide, open the door and windows. Don't pull out or insert the plugs of the appliance.
13. Don't touch the refrigeration surface of the freezing compartment when the refrigerator is in operation, especially when your hand is wet, else you may be glued to the surface.
14. Pull out the plug of power supply during clearance or power outage. Wait at least five minutes to resume the power supply in order to prevent damage to the compressor caused by continuous restart.

Photo used in this manual

The illustration and photos used in this Manual may not base on the final design of products, which may differ from your products in some way.

1-3. How to read this Service Manual

1-3-1. Using Icons

The meaning of each icon is described in the table below:

Note:

A “note” provides information that is not indispensable.

Caution:

A “caution” is used when there is danger, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.

Warning:

A “warning” is used when there is danger of personal injury.

Reference:

A “reference” guides to find additional information on a specific topic.

Chapter 2 Product Feature

2-1. SPECIFICATIONS

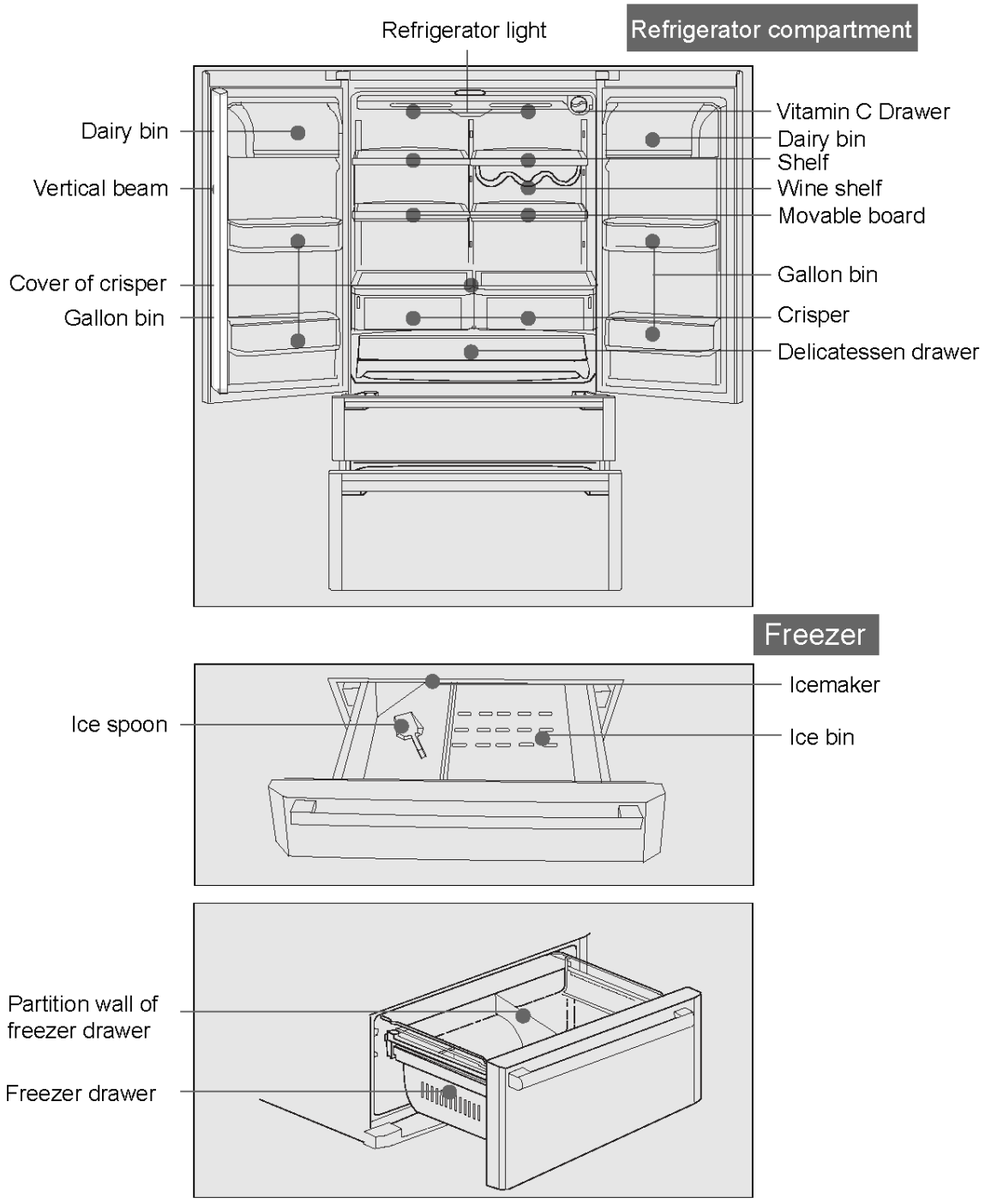
1	Model		HFD647AS	H B21T SSAA
	Photo			
	Product description (Refrigerator/Freezer)		Refrigerator-Freeze	Refrigerator-Freezer
	Type of ap pliance (FS=free standing / BI=built-in)		FS	FS
	Type of cooling system (NF=no frost/ S=static)		NF	NF
	Climate class*			
	Freezer compartment / Star rating		4*	4*
2	Key features			
	Total gross volume			
	Total storage volume	L	518	507
	Defrosting (M=manual A=autom atic)		A	A
	Energy consumption / year			
	Frost free system		yes	yes
	Defrost water outlet		yes	yes
	Air circulating ventilator		yes	yes
	Kind of coolant		R134a/ 160g	R 600a/ 75g
	Foaming components		C-P	C-P
3	Technical data			
	Voltage / frequency	V/Hz	220V-240V~/ 50	220V-240V~/ 50
	Temperature range (from>to)	° C	-22 ~ 7	-22 ~ 7
	Input power	W	220	220
	Cooling system: K=Compressor / A=Absorption		K	K
4	Door:			
	F= flat / R= rounded / S= streamline		S	S
	Inside color		w	w
	Hinged (r =right l =left) / reversible		R / L	R / L
	Freezing compartment integrated with door		Yes	Yes
	Shelves:			
	Number Fridge / Freezer		4 / -	3 / -
	Type (gr=grill / g=glass / p=plastic)		g / P	g / P
	Color w-white / g=green / t=transparent.		t	t

	Adjustable (Y=yes / N=not)		Yes	Yes
	Drawers:			
	Plastic drawers (fully freezing comp.)	n°.	2	1
	Half freezing comp	n°.	2	2
	Color of drawer (w=white/t=transp./g=green)		w/t	w/t
	Crisper:			
	Chiller / Meat (salad crisper) transparent / white		Chiller (t)	Chiller (t)
	Vegetable crisper(s) transparent / white		t	t
5	**Equipment & accessories**			
	Con trol panel:			
	Interior / exterior		Interior	Interior
	Thermometer interior / exterior		Interior	Interior
	Over temperature alarm LED / acoustic		Yes	Yes
	Adjustable thermostat		Yes	Yes
	Fast freeze switch /-function		Yes	Yes
	Deodorizing		Yes	Yes
	Interior light	W	Yes	Yes
	Freeze pack(s)	n°	2	2
	ice maker Manual/ Automatic		A	M
	Ice cube tray(s)	n°	1	1
	Adjustable feet front / rear	n°	2 /FRONT	2 /FRONT
	Castors front / rear		-/yes	-/yes
	Length of cable/incl. plug	cm	245	245
	Condenser Back / Integrated		B	B
6	**Product dimensions**			
	Unit dimensions (H / W / D)	cm	177/91/75	177/91/75
	Net weight	kg	135	130
7	**Packing dimensions & load ability**			
	Packing dimensions (H / W / D)	cm	186/98/76	186/98/76
	Gross weight	kg	148	143
8	**Service**			
	User manual		English	English

2-2. Main Functions

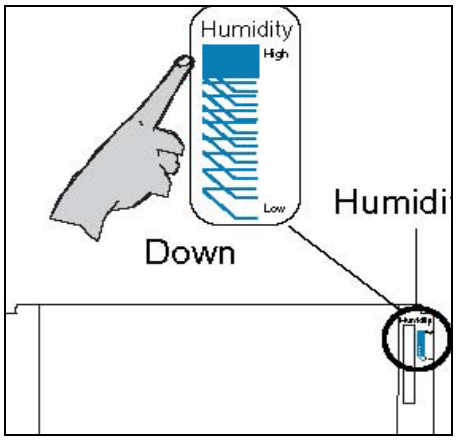
- Removable automatic icemaker
- Foldaway wine holder.
- Large crisper with humidity adjustment.
- Holiday function.
- Fridge storage compartment can be set on/off separately.
- Intelligent alarm function: automatic alarm at over temperature, malfunction, door open.

2-3. External views



2-4. How to Use the Crisper

The appliance is equipped with a crisper for vegetable and fruit storage. You can set the humidity to meet your storage needs.

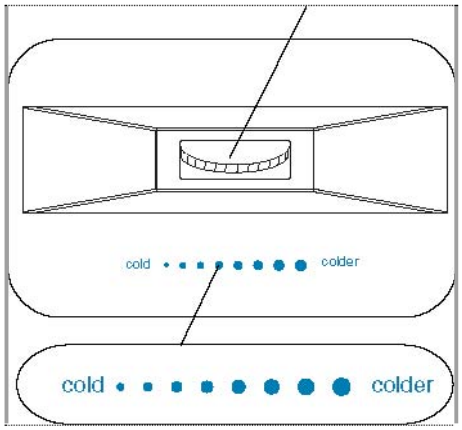


1. Turn the humidity regulator (located at the upper right Humidity regulator corner of the crisper) up to get a higher humidity suitable for storage of cucumber, grape, kiwifruit and persimmon etc.
2. Turn the humidity regulator (located at the upper right corner of the crisper) down to get a lower humidity suitable for storage of strawberry, orange, bean, garlic, watermelon, plum and tomato etc.

2-5. How to Use the Delicatessen Drawer

The appliance is equipped with a delicatessen drawer with a temperature range from-2°C~+3°C.The temperature can be adjusted by the air control knob to meet your storage needs.

1. Turn the air control knob left (weak) to reduce the cooled air moving in the delicatessen drawer and maintain a higher temperature;
2. Turn the air control knob right (strong) to increase the cooled air moving in the delicatessen drawer and maintain a lower temperature.



Chapter3 Disassembly

3-1. Door handle installation

3-1-1.Refrigeration door handle

1. Retrieve the handle clearly marked for the Refrigerator Door that needs attachment.
2. Insert the Handle Connecting Screws into the holes provided on the Refrigeration Door. Using a hand held screwdriver tighten the Handle Connecting Screw until the screw threads disappear and the first flat surface of the Handle Connecti ng Screw tou ches the Refrigerat or Do or surface (as shown in illustration1- step2). Do not over tighten-damage to the door can occur.
3. Place the Refrigeration Door Handle onto the Handle Connecting Screws using the upper hole of the “Top” Refrig eration Doo r Handle (as shown in il lustration 1-step3); The Refrigeration Door Handle should rest comfortably to the door on these Connecting Screws.
4. Insert the Connecting Bolt into the hole at the top of the Refrigerator Door Handle. Using the provided Hex Driver and tighten until the handle is fixed firmly to the door. Repeat this process for the “Bottom” of the Refrigeration Door Handle (as shown in illustration 2-step4) .Be careful when tightening not to scratch the door surface.
5. Place Bolt Covers into the holes on the handle at the top and bottom and push into place (as shown in illustration2- step5).
6. To disassemble the Refrigeration Door Handle, follow these directions in reverse.

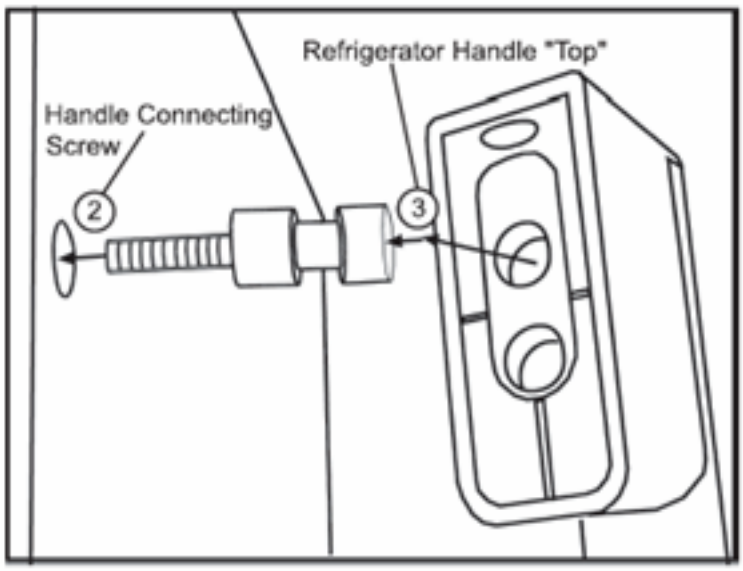


Illustration 1

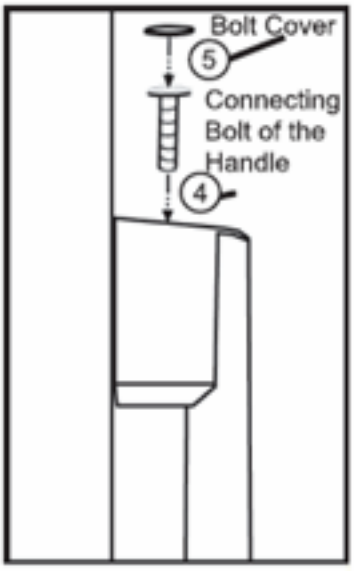


Illustration 2

3-1-2.Freezer door handle

1. Retrieve the handle clearly marked for the Freezer Door that needs attachment.
2. Insert the Handle Con necting Screws into the holes provide d on the Freezer Doo r. Using a hand held screwdriver tighten the Handl e Connecting Sc rew until the screw thread s disappear and the first flat surface of the Handle Connecting Screw touches the Freezer Drawer surface (as shown in illustration1- step2). Do not over tighten-damage to the door can occur.
3. Place the Freezer Drawer Ha ndle onto the Handle Connecting Screws (as shown in illustration1 –step3).The Freezer Drawer Handle should rest comfortably on these Connecting Screws.
4. Insert the Connecting Bolt in to the holes on the bottom of the Freezer Drawer Handle marked “Left”. Using the provided Hex Driver and tighten until the handle is fixed firmly to the door. Repeat this process for the “Right” side of the Freezer Drawer Handle (as shown in illustration 2-step4).Be careful when tightening not to scratch the door surface.
5. To disassemble the Refrigeration Door Handle, follow these directions in reverse.

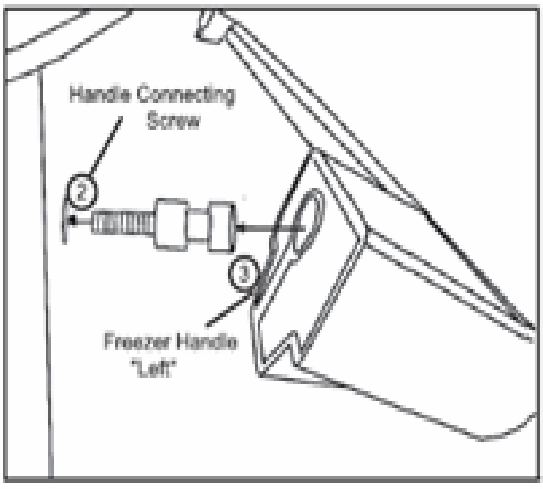


Illustration 1

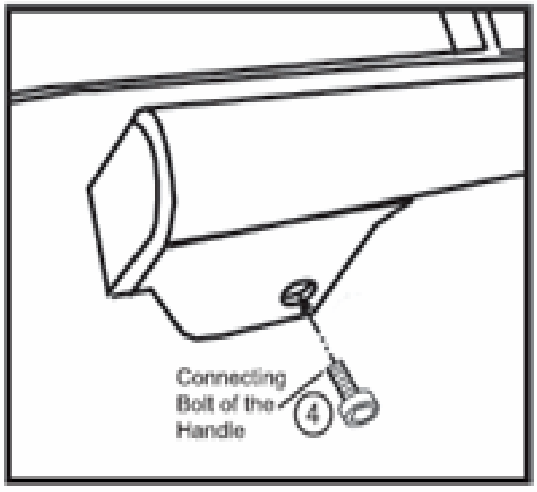


Illustration 2

3-2 Inst alling and Removing Door

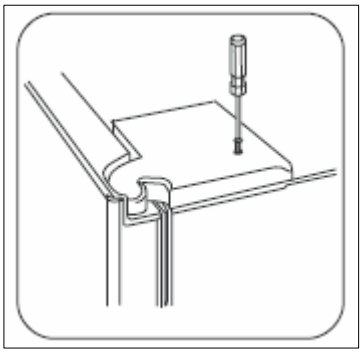
⚠Precautions During Dismantling and Installation of The Door

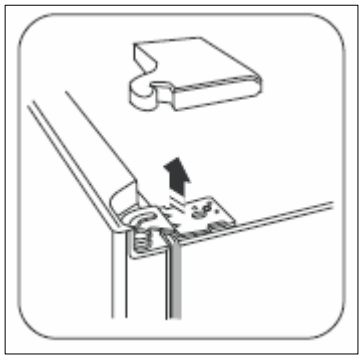
You may not need to remove the doors! But if you have trouble getting the unit into it s final lacation,please follow the below door removal and installation instructions. It is suggected, for your safety, to have two or more people to assist you in completin g the below task to avoid bodily injury, product damage,or properly loss.

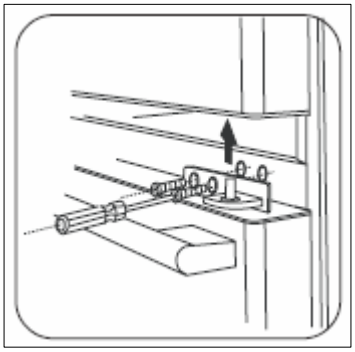
3-2-1. Right French Door Removal and Installation

1. Remove the screws on the top hinge cover
2. Using a screwdriver ,remove the top hinge screws. Remove the hinge, then take the refrigerator door off and place it aside for the time being.
3. Remove the middle hinge,if needed.
4. Install the refrigerant door in reverse sequence,

⚠When lifting up the refrigerator hinge and separating it from the door body,please be careful not to drop the door slanted forward.



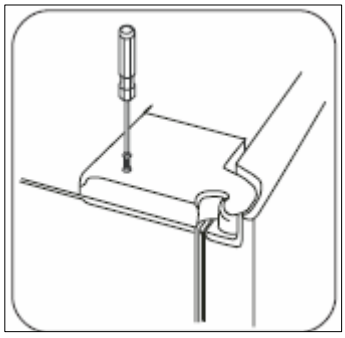


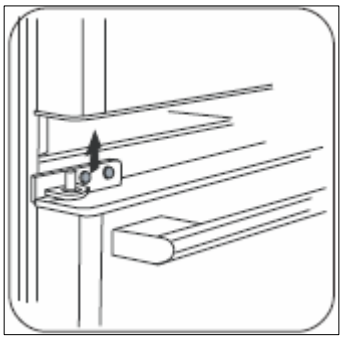
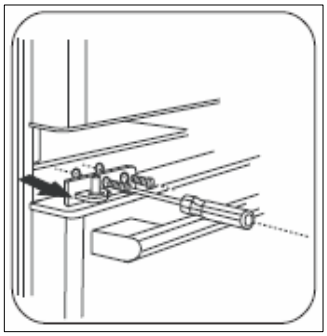


3-2-2. Left French door removal and installation

1. First remove the top hinge cover as above.
2. Disconnect the water line from back of unit
3. Remove the hinge screws using a screwdriver, and take off the hinge, then remove the door body and place it in a safe position. Disconnect the wire cable connector, ground wire and pull water line out from cabinet.
4. Please remove the middle hinge, if needed.
5. Install the door in the reverse order.

⚠When lifting the hinge as it separates from the door, be careful it does not lean for ward and fall, causing you bodily harm or damaging the door.



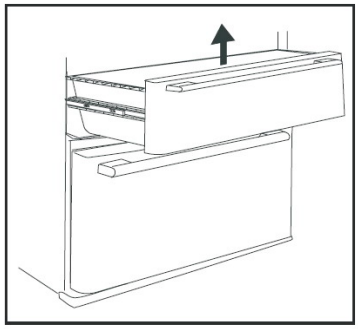
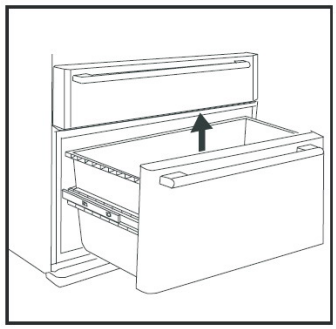



3-3.Removing and installing Lower Freezer Drawer (If required)

1. First open the drawer as far as possible, and then remove the screw on each side of the drawer.
2. Then pull the drawer body up and towards you, and put it aside in a safe place.
3. Install the drawer in the reverse order.

⚠ Keep children and pets from playing inside the lower drawer as a hiding place. Use caution after drawers and removed, due to the possibility of the plastic track protruding from unit

HFD647：

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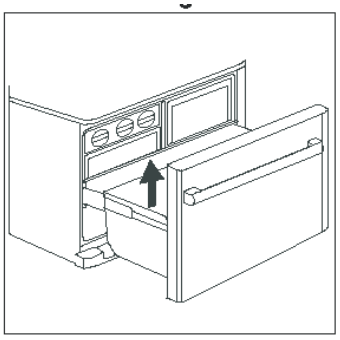
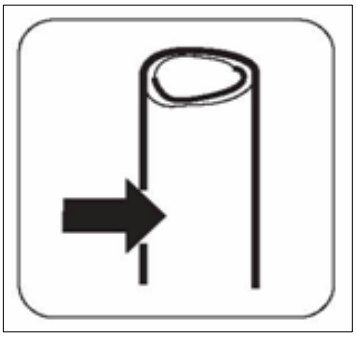


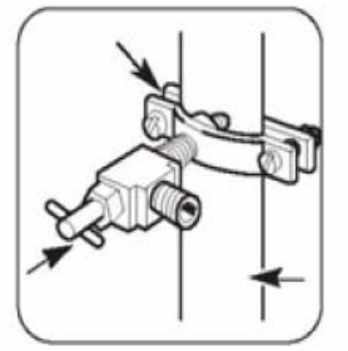
3-4 Water line installation

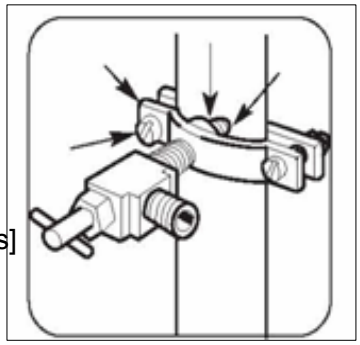
Installation of connecting valves and plumbing must follow all local plumbing guidelines, laws and restrictions.

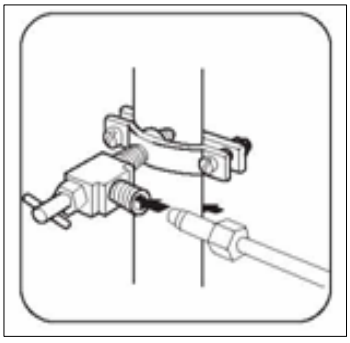
Install the shutoff valve on a cold water supply line that is frequently used

1. Turn off the main water supplying pipe routine
   Turn on the nearest tap till the water pipe is cleaned completely
2. Choose the position of the valve
   Choose a position for the valve that is easy to be approached. It is recommended that the valve is connected to the side of a vertical water pipe, and if it is really needed to connect the valve to a level water pipe .Connect it to the upside of the water pipe not the downside, in case the sediment may flow out from the water pipe.
3. The hole of the drill valve
   Drill a hole of 1/4inches on the water pipe using a sharp drill (even using an automatic valve). Clean the burr left on the water pipe by the drill.
   Use care not to allow water to flow into the drill
4. Tighten the shutoff valve
5. Tighten the pipe tip
   Tighten the bolts of the pipe tip till the closing begins to expand. Don't let the bolts If the pipe tip be too tight, otherwise the water pipe is pressed flat.
6. The deposing line of the pipe
   The deposing line between the cold water pipe and the refrigerator
   Drill a hole on the wall or on the floor that is near the wall to a great degree, and let the pipe line go through the hole
   Assure the pipe has an enough margin area (about 8 inches [2.4 meters] and make it be three circles with the diameter of each circle about 10 inches [25centimeters].and after this installment is done, the refrigerator can be moved away from the wall.
7. Connect the pipe to the valve
   Put the Tightened nuts and the copper shaft on the end side of the pipe and connect the pipe to the stopping valve. Make sure that the pipe is cut into valve completely. Tighten and press the nut.









8. Clean the Pipe

   Power the main water supply till the water in the pipe becomes clean.

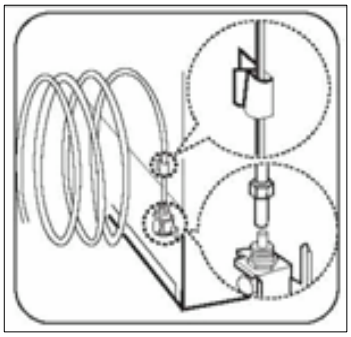
   Turn off the water valve after having used water of about 1V.

9. Connect the pipe to the refrigerator.

Before connecting the pipe to the refrigerator, make sure that the power line is not cut into the electric plug on the wall.

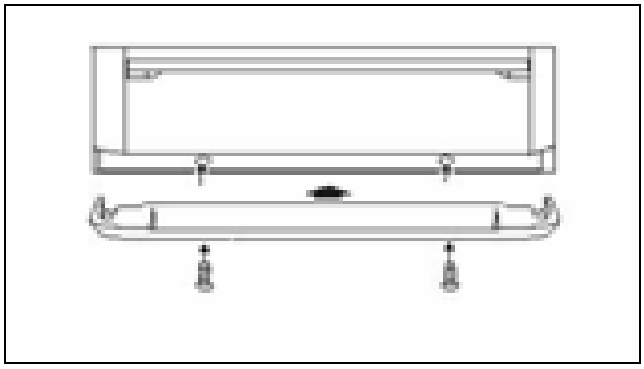
(1) Tighten the water pipe on the water valve and take the nut off the water pipe.

(2) And then ,as shown in the figure ,connect the end side of the water pipe to the water valve; tighter the water pipe using tightening nuts.



3-5. Kick Plate Installation

The kick plate is packed in the fresh food compartment. Attach the panel with the screws provided.

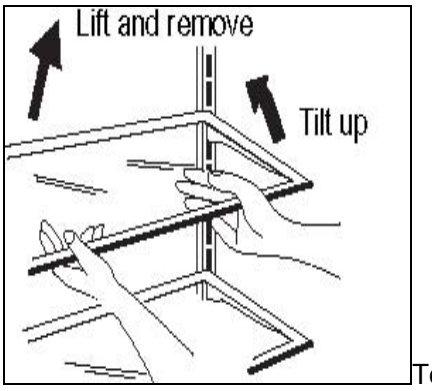


3-6. Height-adjustable Shelf

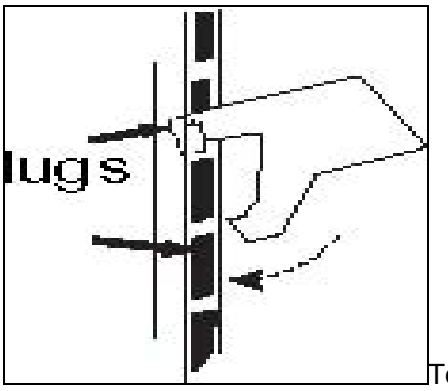
The height of shelf can be adjusted to meet your storage needs.

To adjust the shelf height, remove the shelf first. The steps are as follows:

1.tilt the shelf up at front, and lift it up and out of tracks. 2. To replace the shelf, wi th shelf front raised slightly, engage the lugs in tracks. Then lower shelf front until it locks into position.



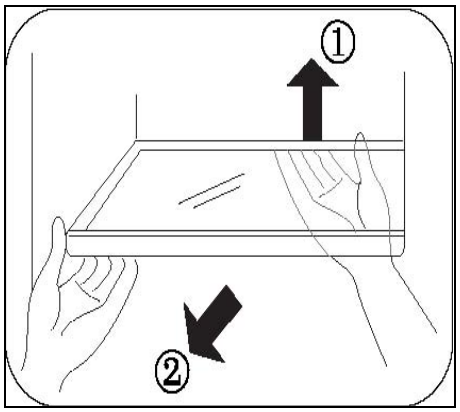
To replace



To remove

3-7. Removing Crisper Cover

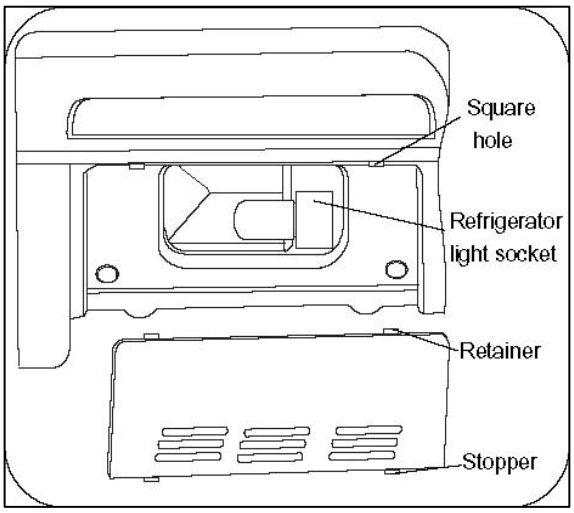
Take out the crisper and put it away. Lift up the cover end (1) and remove it (2).



3-8. Replacing the Light Bulb (refrigerator)

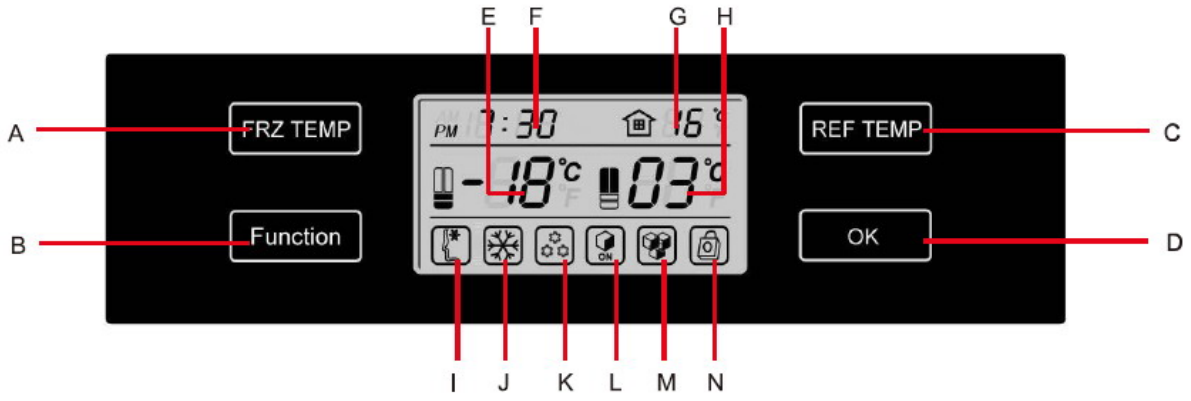
Bulb specifications: 220V~, 25W Socket: E14 (DO NOT use a bulb over 25W)

1. Unplug the appliance
2. To remove the light shield, press the stopper At rear out of the square hole
   Pull the shield backward until the retainer is Separated from the square hole
3. Turn the bulb anticlockwise and out. Replace a Bulb of the same specifications in the reverse sequence of removal.
4. To replace the light shield: Engaged the retainer Into the square hole and then press the shield Rear forward until the stopper is locked in the square hole.



Chapter 4 Control and display system

(1) Control display board



A—Freezer temperature adjustment key
B—Functio n setting key
C—Refrigerator temperature adjustment key
D—Function confirmation key
E—Freezer temperature indicator
F—T imer indicator
G—Ambient temperature indicator
H—Refrige rator temperature indicator
I— Artifical intelligent indicator
J—Quick freezer indicator
K—Quick refrigerating indicator
L—Icema ker indicator
M—Quick ice-making indicator
N—Lock indicator

(2) Artificial intelligence setting

In the artificial intelligence state, the appliance automatically adjusts temperature according to the variation of ambient and compartment temperature without manual adjustment. In the unlocked state, lightly press the Function Selection key (B) several times until the Artificial Intelligent Indicator (I) flashes and then press the Function Confirmation key (D). The Artificial Intelligent Indicator (I) illuminates and the appliance enters the artificial intelligence state. In the artificial intelligence state, lightly press the Function Selection key (B) several times until the Artificial Intelligent Indicator (I) flashes and then press the Function Confirmation key (D). The Artificial Intelligent Indicator (I) goes off and the appliance exits the artificial intelligence state.

(3) Locking/unlocking setting

In the unlocked state, lightly press the Function Selection key (B) several times until the Lock Indicator (N) flashes and then press the Function Confirmation key (D). The Lock Indicator (I) illuminates and the appliance enters the locked state. In the locked state, lightly press the Function Selection key (B) several times until the Lock Indicator (I) flashes and then press the Function Confirmation key (D). The Lock Indicator (I) goes off and the appliance exits the locked state.

In the locked state, adjustment of refrigerator temperature, freezer temperature, artificial intelligent, quick freezing, quick refrigerating, ice maker switching and quick ice making functions are deactivated.

(4) Quick freezing setting

The quick freezing function is designed to keep the food nutrition by making the food completely frozen within the shortest time possible. In the unlocked state, lightly press the Function Selection key (B) several times until the Quick Freezing Indicator (J) flashes and then press the Function Confirmation key (D). The Quick Freezing Indicator (J) illuminates and the appliance enters the quick freezing state. The quick freezing state will exit automatically after approximately 3 hours. If you want to exit the quick freezing state manually, please lightly press the Function Selection key (B) several times until the Quick Freezing Indicator (J) flashes and then press the Function Confirmation key (D). The Quick Freezing Indicator (J) goes off.

(5) Quick refrigerating setting

The quick refrigerating function is designed to quickly cool the food in the refrigerator to a set temperature. It is helpful for long-term storage of food. If you have stored much food in the refrigerator at one time, please activate it. In the unlocked state, lightly press the Function Selection key (B) several times until the Quick Refrigerating Indicator (K) flashes and then press the Function Confirmation key (D). The Quick Refrigerating Indicator (K) illuminates and the appliance enters the quick refrigerating state. The quick refrigerating state will exit automatically when the temperature reaches the setting. If you want to exit the quick refrigerating state manually, please lightly press the Function Selection key (B) several times until the Quick Refrigerating Indicator (K) flashes and then press the Function Confirmation key (D). The Quick Refrigerating Indicator (K) goes off.

If the quick refrigerating or quick freezing function is activated in the artificial intelligent state, the appliance will automatically exit from the artificial intelligent state. Likewise, if the artificial intelligent function is activated in the quick refrigerating or quick freezing state, the appliance will automatically exit from the quick refrigerating or quick freezing state.

(6) Switching off the ice maker

Upon first powering on, the icemaker is ON and the Ice Maker Indicator (L) illuminates. If you don't want the ice maker to work, please lightly press the Function Selection key (B) several times in the unlocked state until the Ice Maker Indicator (L) flashes and then press the Function Confirmation key (D). The Ice Maker Indicator (L) will go off and the icemaker will go off.

■ Adjusting water feeding time of the ice water

In the locked state, press and hold down the Freezer Adjustment key (A), Function Selection key (B), Refrigerator Adjustment key (C) and Function Confirmation key (D) for 3 seconds simultaneously to activate the water feeding time adjustment function. The freezer temperature indicator displays the integer second of the water feeding time. The refrigerator temperature indicator displays the decimal point and the time. Press the Refrigerator Adjustment key (C) to increase the time and the Freezer Adjustment key (D) to decrease. If no key is operated in 5 seconds or the Function Selection key and Function Confirmation key are pressed to directly confirm the time, it will automatically exit the water feeding time adjustment state. Upon first powering on, the water feeding time is 8.5 seconds each time. The consumers are recommended not to change the setting. If you do want to change it, please contact our after-sales service technician.

(7) Quick ice making function

When you want a large amount of ice cubes, you can use the quick ice-making function. In the unlocked state, lightly press the Function Selection key (B) several times until the Quick Ice Making Indicator (M) flashes and then press the Function Confirmation key (D). The Quick Ice Making Indicator (M) illuminates and the appliance enters the quick ice making state. The quick ice-making mode will exit automatically after 24 hours. If you want to exit the quick ice-making state manually, please lightly press the Function Selection key (B) several times until the Quick Ice-Making Indicator (M) flashes and then press the Function Confirmation key (D). The Quick Ice-Making Indicator (M) goes off.
If you turn off the icemaker when it is in quick ice making mode, it will exit the quick ice making state as well as the ice making state.

You can activate the quick ice making function only when the icemaker is ON. Please make sure the icemaker of your appliance is ON before activating the quick ice making function. If you activate quick ice making when the appliance is in the artificial intelligent state, it will automatically exit from the artificial intelligent state. Likewise, if you activate the artificial intelligent when the appliance is in the state of quick ice making, it will automatically exit from the quick ice making state.
Connect to potable water supply only.
the maximum inlet water pressure 1000k,in pascals
the minimum inlet water pressure 100k,in pascals
The pressure of the cold water supplied to the ice maker should be within 100k-1000k,in pascals.
The new hose-sets supplied with the appliance are to be used and that old hose-sets should not be reused.

(8) Temperature setting and adjustment

Temperature setting and adjustment can be performed as with the following operations only when the appliance is not in the state of artificial intelligent (the Artificial Intelligent Indicator does not illuminate):
Refrigerator temperature adjustment: in the unlocked state, press the Refrigerator Adjustment key (C). The Refrigerator Temperature Indicator (H) flashes. The refrigerator temperature cycles in the sequence of 7? →5? →3? →2? →1? →7? each time you press the Refrigerator Adjustment key (C).
Freezer temperature adjustment: in the unlocked state, press the Freezer Adjustment key (A). The Freezer Temperature Indicator (E) flashes. The freezer temperature cycles in the sequence of -16? →-17? →-18? →-20? →-22? →-16? each time you press the Freezer Adjustment key (A).

(9) Door-open warning

If the door is not properly closed or is opened for an extended period, the appliance buzzer will sound at a certain interval to prompt you to close the door properly.

(10) Energy-saving display

The back-light of the display goes off 30 seconds after a key operation to save electricity and illuminates when any key is operated or any door is opened.

(11) Power-off memory

In the case of power failure, the appliance will save the work state at the moment of power failure and continue to work with the work state after the power is recovered.

Locking function and time are not saved.

(12) Time adjustment and display

In the unlocked state, press and hold down the Refrigerator Adjustment key (C) and Freezer Adjustment key (A) for 3 seconds simultaneously to enter the time adjustment state. The Time Indicator (F) flashes. Press and Freezer Adjustment key (A) to adjust the hour, cycling from 1 to 12. Press and Refrigerator Adjustment key (C) to adjust the minute, cycling from 00 to 59. It will change between AM and PM at the moment of 12:00 (AM means Ante-Meridian and PM means Post-Meridian).

(13) Ambient temperature display

The ambient temperature indicator (G) displays the ambient temperature at which the appliance is currently operating.

Chapter 5 Control principal and related test functions

5-1. Air Damper

(1) The refrig eration air damper is controlled with the fresh food storage te mperature sensor R SNR.

(2) The air damper is closed from the beginning of defrosting until 15 minutes after the defrosting is finished.

(3) Upon initial powering on or resetting of the control panel, the air damper conducts a close-and-open cycle before acting according to the control conditions in item (1).

(4) The air damper will be forced to conduct an open-and-close cycle if it has been closed for 1 hour. After that, its closing/opening will be controlled by RSNR.

(5) The air damper will automaticlly close when REF. door has been opend over 2 minutes.

5-2. Control Principle of the Fan motor

Control principal of the evaporator fan motor and fresh food damper.

1 . When a fresh food door is opened, the evaporator fan motor will operat e on high speed and the damper will be full open. After 2 minutes with the door open, the damper will close but the evaporator fan motor will operate according to the compressor function.

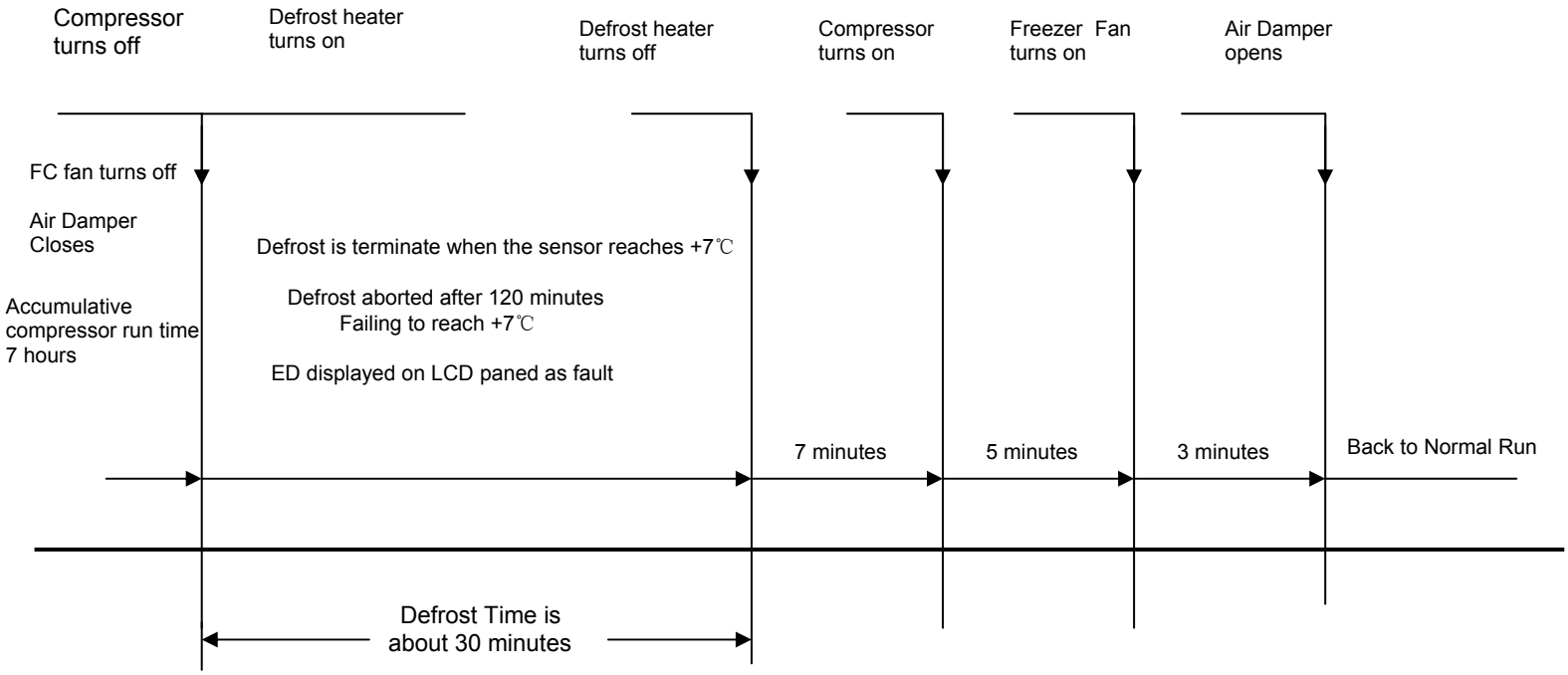
2. The evaporator fan motor will not operate if the freezer door is open ,even if the fresh door is open.

3. An error code alerting of a fan motor problem will appear (see error code section) if the motor speed is below 300rpm or does not operate for longer than 30 seconds during the run cycle.

Condenser fan motor's controlling:

The motor works with compressor synchronous.condenser fan motor has a 12V's power supply voltage while the rotate speed 1150RPM on normal. And high speed operation is 13.5v - 1300rpm.

5-3.Defrosting Control Principle of HB21TSSAA & HFD647* Refrigerator


Compressor turns off
Defrost heater turns on
Defrost heater turns off
Compressor turns on
Freezer Fan turns on
Air Damper opens
FC fan turns off
Air Damper Closes
Accumulative compressor run time 7 hours
Defrost is terminate when the sensor reaches +7℃
Defrost aborted after 120 minutes Failing to reach +7℃
ED displayed on LCD paned as fault
7 minutes
5 minutes
3 minutes
Back to Normal Run
Defrost Time is about 30 minutes

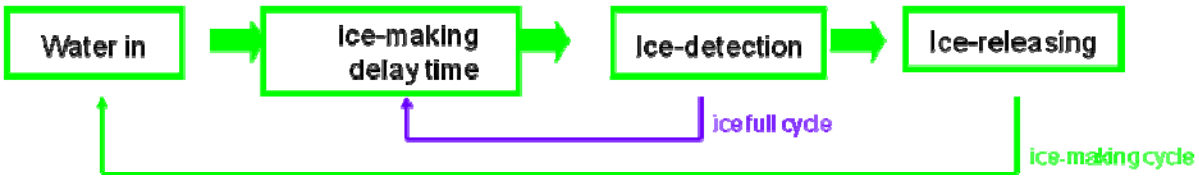
Defrost Heater control rule

Defrost heater will be controlled according to the following :

1 The very first defrost will occur 4 hours after cabinet has been switched on or after a replacement control board fitted.
2 If the PC sensor temperature is greater than 10℃ a defrost will occur.
3 If the FC temperature is above –5℃ a defrost will occur.
4 If the PC & FC doors have been opened more than 5 times before the cabinet has run for 5 hours after first being switched on.
5 If none of the above conditions (1) (2) (3) (4) have occurred a defrost will take place after 7 hours of accumulative run time, terminating when the defrost sensor reaches +7℃
6 The defrost will be aborted after 120 minutes with the defrost sensor failing to reach +7℃
7 Fault code ED will be displayed.
8 If the defrost sensor fails, a forced defrost will occur every 120 minutes.
9 If Fast freeze or fast fridge is selected while the cabinet is in defrost mode, these modes will not occur until the defrosting has been completed.

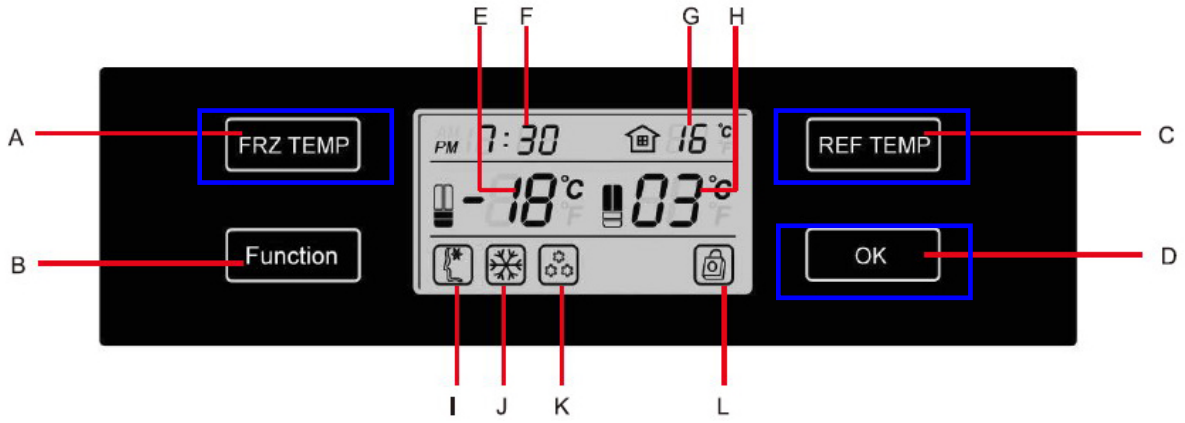
In order to minimize the rise in temperature while defrosting the system will go into advance cooling lower the FC temperature below the normal switch point by –3℃ . If the cabinet cannot reach this temperature with in 30 minutes a forced defrost will occur.

5-4 Ice-making process （HFD647AS / HFD647AW）



1. Water in: The machine let water into ice-maker after ice releasing action
2. Ice-making delay time: Include two conditions, one condition is that the ice-ma king time reach to 60 minutes, another conditio n is that the ice-maker senor te mperature is low er than -14℃. It must be meet these two conditions, the ice maker could overturn and make ice cube.
3. Ice-detection: When ice- maker is under w orking status, ice-measure st aff move d ownward firstly to detect if the ice is full. If the measure-staff can mo ve to the lowest pos ition, it means that the ice in ice-drawer is not full, and it can continue next ice-releasing action. If the me asure-staff can not move to the lowest position, machine will take for the ice in ice-drawer is full, and return to ice-making delay time to wait another ice-detection action, and then come into being cycle.
4. Ice-releasing: If the result of ice-detection is not full, ice- box w ill rot ate to release ice. After ice-releasing, machine going on another water in action, and then come into being cycle.

5-5 Self-testing Function of HB21TSSAA & HFD647A* Refrigerastor



(1) Hold the REF TEMP setting button (C) ,FRZ TEMP setting button (A) and OK button (D) three keys for 3 seconds, until it show T1 T1 with a buzzer, the products will enter compulsive starting mode.

(2) The same operation like step (1) under mode TEST1 until it show T2 T2, then the product will enter compulsive defrosting mode

(3) The same operation like step (1) under mode TEST2 until it show T3 T3, then the product will enter inspection mode of mullion heater and beam heater .

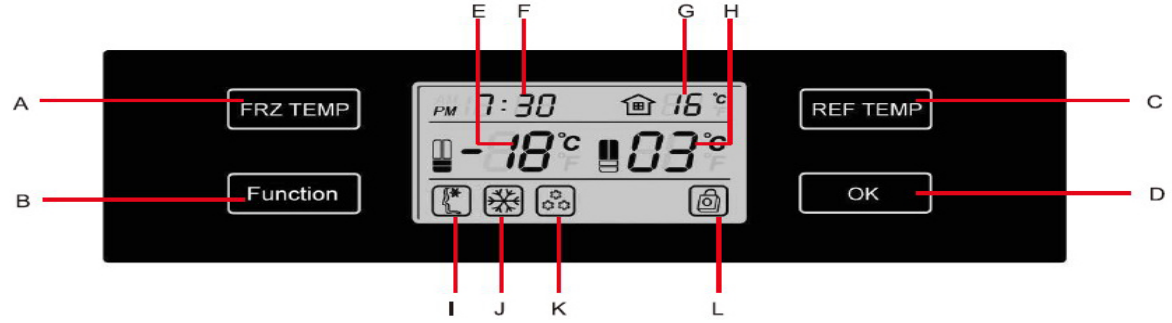
(4) Under TEST3 mode, keep pressing the REF TEMP setting button (C) ,FRZ TEMP setting button (A) and OK button (D) three keys for 3 seconds, the refrigerator will quit TEST mode and back to normal.

MODE	OPERATION	CONTENT	NOTE
TEST1 (For testing the capability of cooling)	Keep pressing REF TEMP, FRZ TEMP and OK button three keys for 3 seconds until it show T1 T1, the products will enter compulsive starting mode.	1) compressor start working 2) freezer fan motor start working 3) cooling fan motor start working 4) defrost heater closed 5) air damper open 90° 6) show T1/T1 at refrigerator/freezer setting of display board	Mode TEST1 continues until exit manual

TEST2 (For testing the defrost system)	Under mode TEST1, Keep pressing REF TEMP, FRZ TEMP and OK button three keys for 3 seconds until it show T2 T2, then the product will enter compulsive defrosting mode	1) compressor shutdown 2) freezer/cooling fan motor shutdown 3) defrost heater start working 4) mullion heater shutdown 5) air damper and its heater shutdown 6) freezer/refrigerator setting display T2/T2 at display board	When temperature around defrost sensor above 7 degree, appliance will exit <Force defrost MODEL> after heater working 1 minute! When temperature around defrost sensor below 7 degree, heater will work continually until reach 7 degree, appliance then exit
TEST3 (For testing assist heaters)	Under mode TEST2, Keep pressing REF TEMP, FRZ TEMP and OK button three keys for 3 seconds until it show T3 T3, then the product will enter inspection mode of mullion heater and beam heater .	1) compressor shutdown 2) freezer/cooling fan motor shutdown 3) defrost heater shutdown 4) Mullion heater and beam heater start working 5) air damper heater start working 6) freezer/refrigerator setting display T3/T3 at display board	Heaters of air damper and refrigerator mullion heater is under working. exit the inspection program after 30 minutes and back to normal
BACK TO NORMAL	Under TEST3 mode, keep pressing REF TEMP, FRZ TEMP and OK button three keys for 3 seconds, the refrigerator will quit TEST mode and back to normal	Function back to normal (compressor start to work 7 minutes later)	

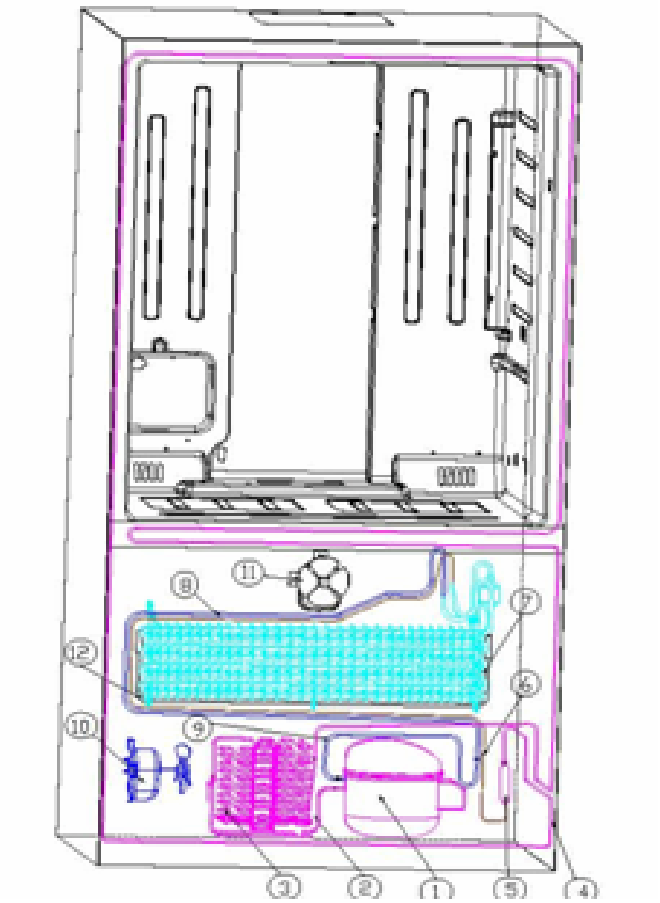
5-6 Ice-maker Inspection Mode

Under Unlock state, press both Function setting button (B) and OK button (D) for 3 seconds until hear one sound of buzzer, products enter ice-maker inspection mode. In this mode, Ice-maker will forced turnover once, then inhale water according pre-setting water volume.



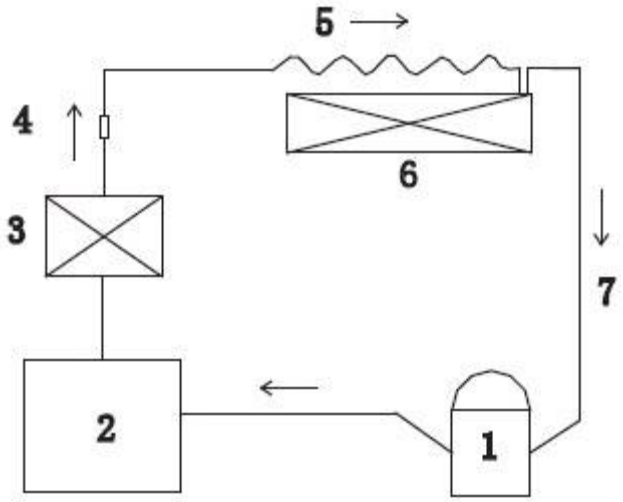
Chapter 6 System flow principle

6-1.System flow scenograph



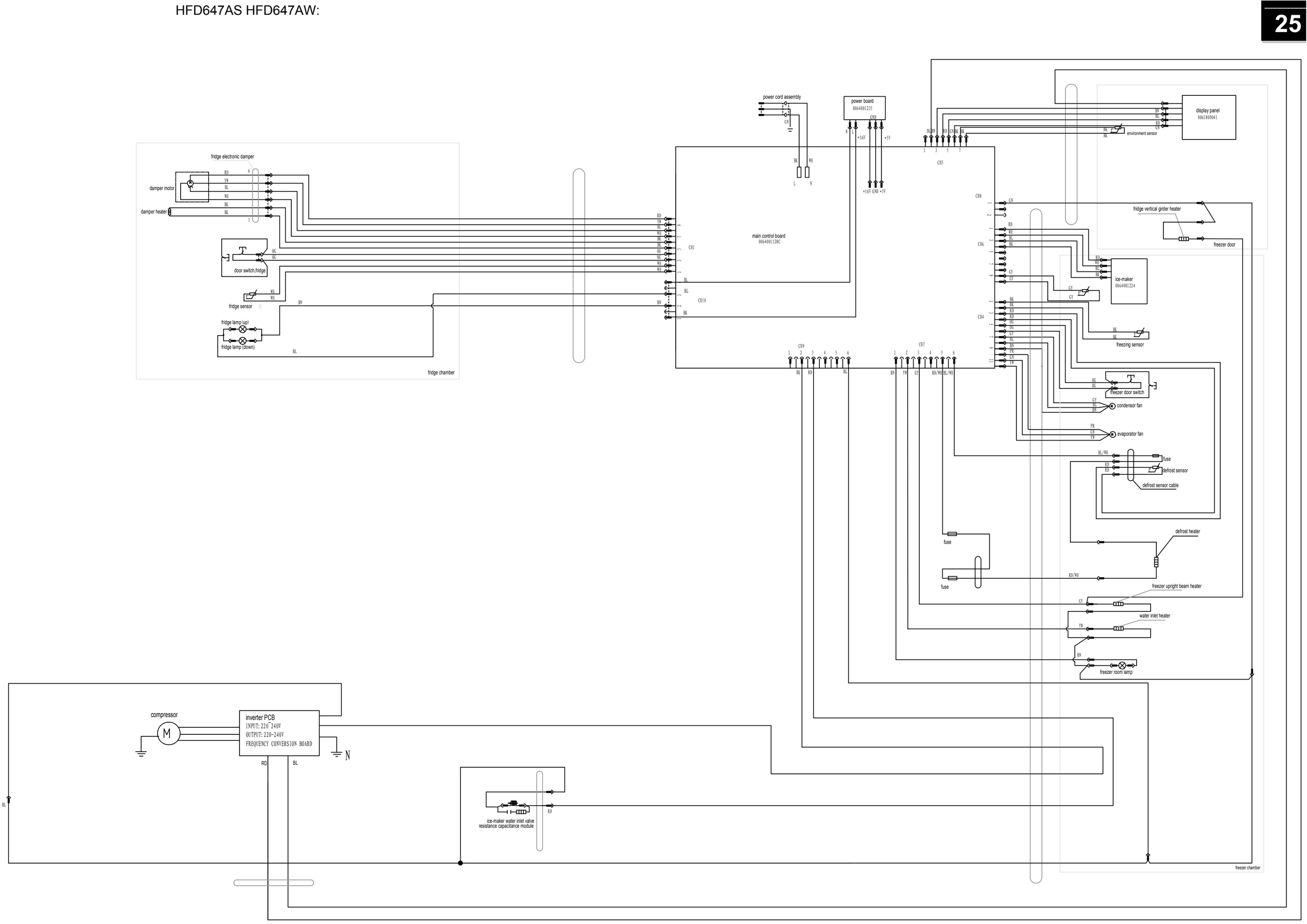
(1) Compressor
(2) Hot connector pipe
(3) Condensor
(4) Freezer anti sweat tube
(5) Drier filter
(6) Capillary
(7) Evaporator
(8) Suction pipe
(9) Connector pipe
(10) Compressor DC fan motor
(11) Freezer DC fan motor
(12) Defrost steel tube heater

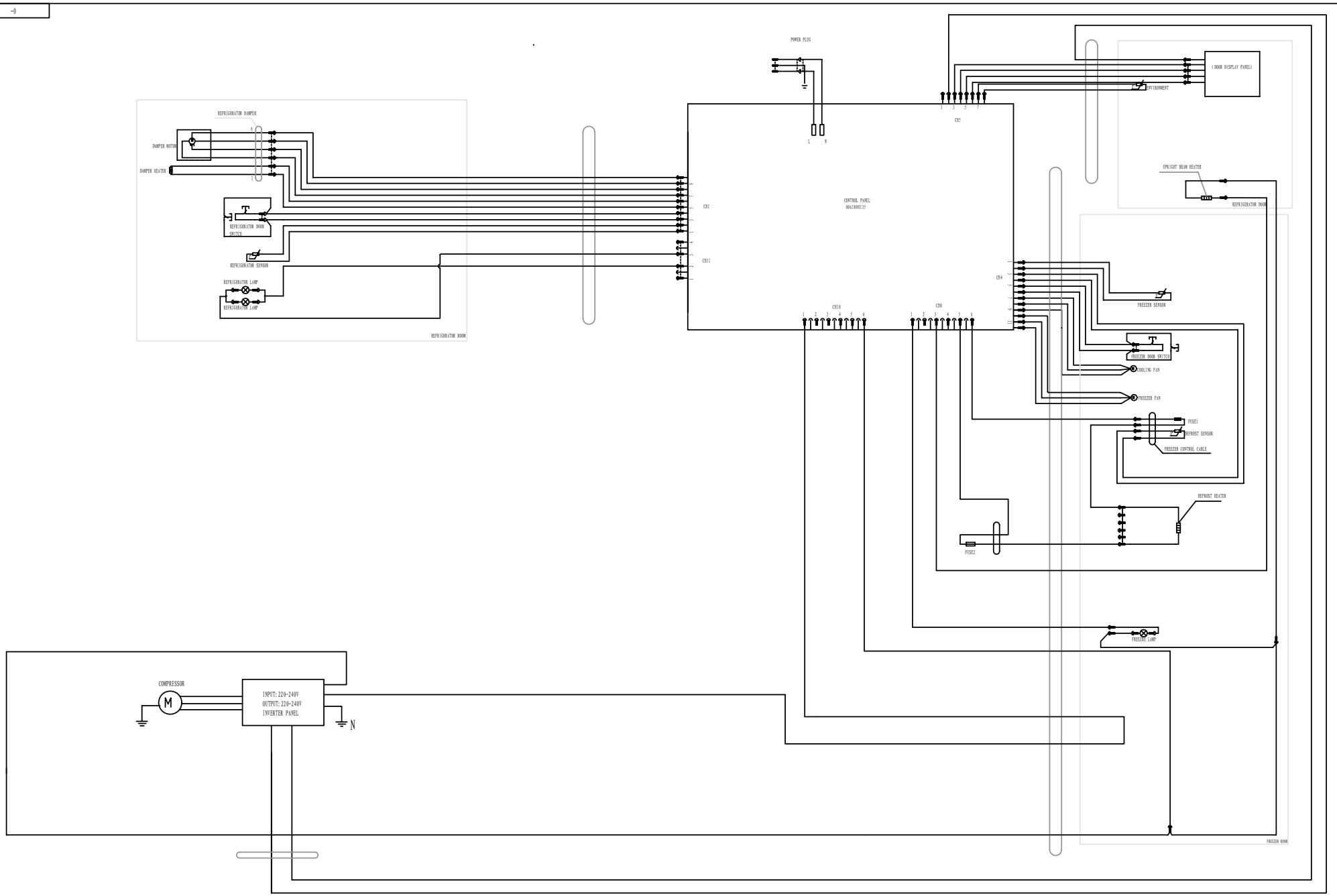
6-2.System flow chart



(1) Compressor
(2) Dew proof pipe
(3) Condenser
(4) Drier filter
(5) Capillary
(6) Evaporator
(7) Connector pipe

HFD647AS HFD647AW:





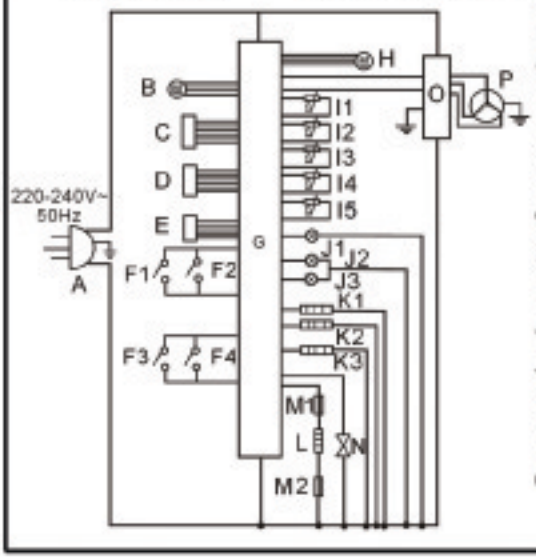
专用号:

标记	处数	分区	更改文件号	签名	年月日	HB21T接线图		青岛制冷技术研究所	
设计			工艺					项目经理	
制图			标准化						
会签			审定			阶段标记	质量	比例	
审核			批准			S		1:1	
						共 1 张	第 1 张		

描(或)其件登记										
底 图										
CAD										
入库录字										
旧底图总号										
底图总号										
签 字										
日 期										
标 记	处 数	分 区	更改文件号	签 字	日 期					

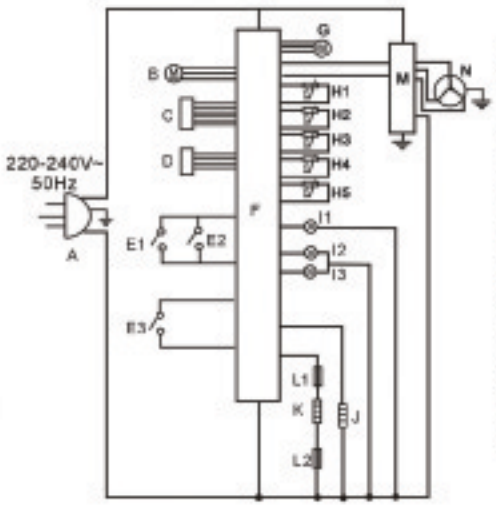
7-2. Brief principle diagram

Haier REFRIGERATOR-FREEZER HFD647AS



A. Power plug B. Freezer fan motor
C.Refrigerator damper D. Ice maker
E. Door diaplay panel F1. Refrigerator door switch 1
F2. Refrigerator door switchl 2 I5.Humidity sensor
F3. Freezer door switch1 F4. Freezer door switch2
G. Control panel H. Cooling fan motor
I1. Defrost sensor I2. Freezer sensor
I3. Refrigerate sensor I4. Enviroment sensor
J1. Freezer lamp J2. Refrigerate lamp 1
J3. Refrigerate lamp 2 K1. Crossbeam heater
K2. Upright beam heater K3. Water inlet heater
L. Defrost heater M1. Fuse M2. Fuse N. Water valve
O. Inverter P. Compressor

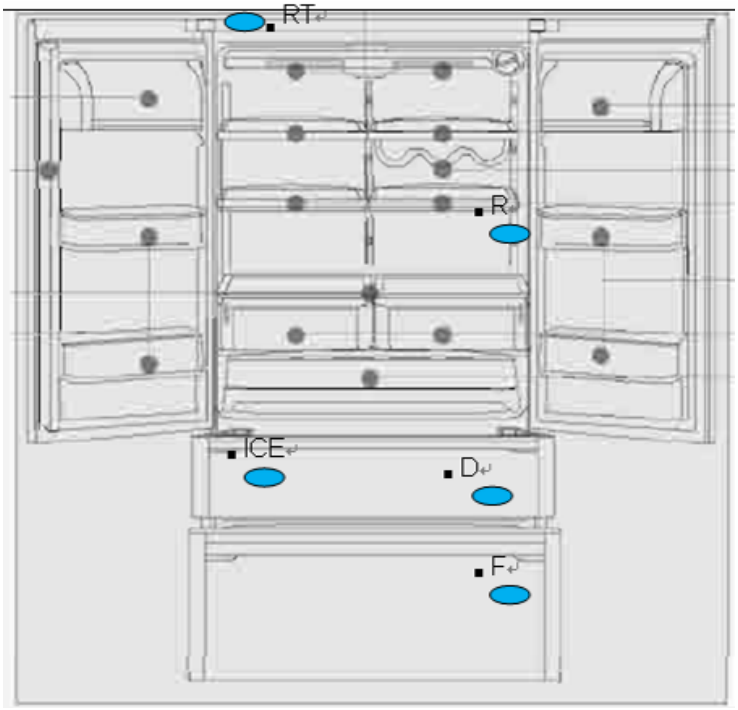
Haier REFRIGERATOR-FREEZER HB21TSSAA



A.Power plug B.Freezer fan motor
C.Refrigerator damper D.Door display panel
E1. Refrigerator door switch 1 F. Control panel
E2. Refrigerator door switchl 2 H1. Defrost sensor
E3. Freezer door switch H3. Refrigerator sensor
G. Cooling fan motor H5.Humidity sensor
H2. Freezer sensor I1. Freezer lamp
H4. Environment sensor I3. Refrigerator lamp 2
I2. Refrigerator lamp 1 K. Defrost heater
J. Refrigerator heater L1. Fuse L2. Fuse
M. Inverter N. Compressor

7-3. Sensor And Error Code

Senor Position:



Remark: There is no ICE sensor for model HB21TSSAA.

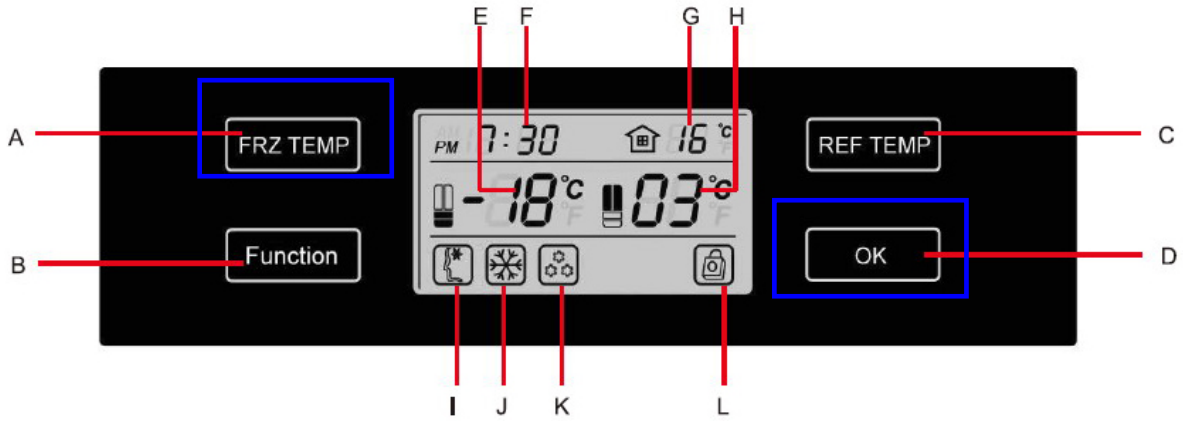
ERROR CODE LISTS:

Error description	Error Code	Meanings of Code
(R SNR) Refrigerator sensor malfunction	F1	R1 SNR short circuit or open circuit
(F SNR) Freezer sensor malfunction	F2	F SNR short circuit or open circuit
(RT SNR) Ambient temperature sensor malfunction	F3	RT SNR short circuit or open circuit
(D SNR) Defrost sensor malfunction	F5	D SNR short circuit or open circuit
(ICE SNR) Icemaker sensor malfunction	F6	ICE SNR short circuit or open circuit
Freezer fan motor malfunction	E1	No single send out more than 30 seconds
Cooling fan motor malfunction	E2	No single send out more than 30 seconds
Defrost Heating System error	Ed	Defrost sensor temperature can't reach to 7 centigrade after temperature rise more than 2 hours
Icemaker system malfunction	Er	Can't detect on/off single when icemaker rotate

7-4 Display Error Codes Information

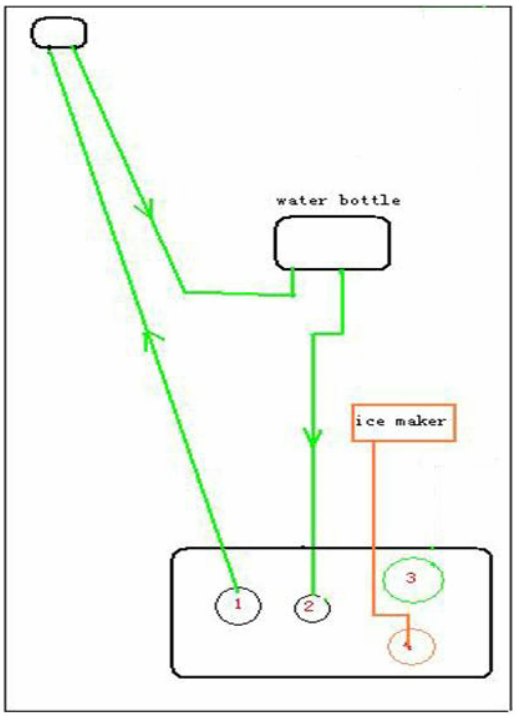
The machine will not display error codes automatically when it is in malfunction.

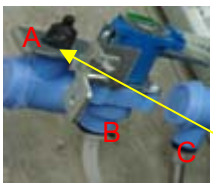
Under Locked st ate, hold and press both FRZ TEMP setting button (A) and OK button (D) for 3 seconds, with a buzzer , the products will enter error codes display mode. The same as above operation can recover to normal disp lay st atus. If no manually operation, it will recover to normal display status after 1 minute.

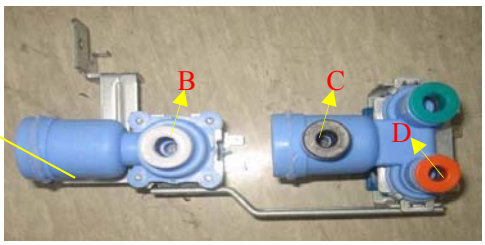


Chapter 8 Water Line Map (HFD647A*)

8-1. The water line sketch map



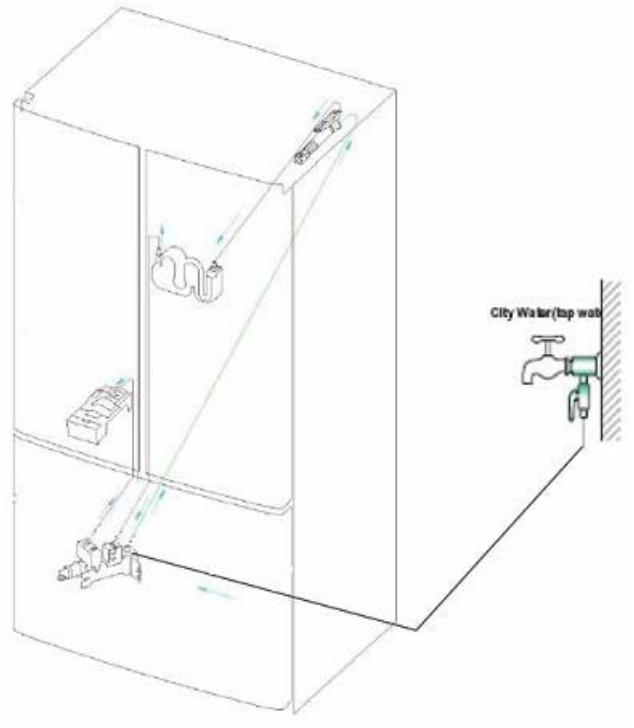




Connection the water pipes for the ice maker:

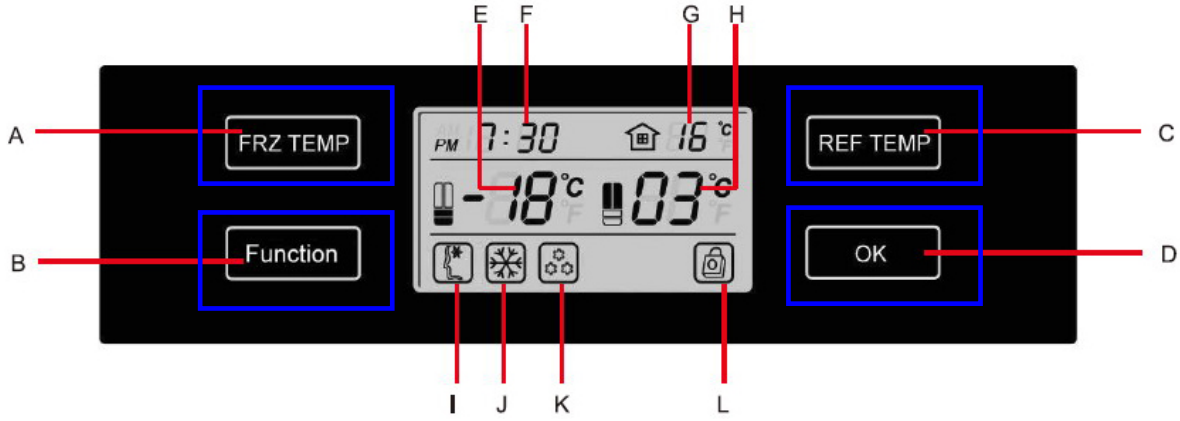
1. Connect tap water to the inlet A of the main valve
2. Connect the outlet B of the main valve to the water filter then connect the pipe to the water bottle.
3. The water that is chilled in the wate r bottle flows to the inlet C of the distributor, and then enters into pipe D through the icemaker valve to supply water to the icemaker;

8-2. Water line scenograph



8-3. Water inlet quantity setting

Water inlet quantity can be controlled through button on the display control panel.
Under Locked state, press A, B, C, D four keys simultaneously for 3 seconds with the buzzer beeps once, then enter into inl et quantity a djustment. The inlet time can be set between 5 seconds to 1 1 seconds, press FRZ TEMP button and REF TENP button to adjust water inlet time.



Chapter 9 Trouble shooting

9-1. Frequently problem

Water/moisture/frost in the refrigerator		
Moisture accumulates on the refrigerators inner walls	● Hot and moist climate. ● The door is not closed tightly ● The door is opened too frequently or for too long time	● Accumulation of frost and moisture accelerate in such climate. ● Make sure the refrigerator is level and there is no food or container interfer ing with the door ● Do not open the door so frequently
Water/moisture/frost on outside surface of the refrigerator		
Moisture accumulates on the refrigerator's outside surface or between two doors	● Damp climate ● The refrigerator door is not closed tightly. This causes mixing of the cold air in the refrigerator with the warm air outside it	● It is normal in damp climate. The moisture will decrease when the humidity drops. ● Make sure the refrigerator is level and there is no food or container interfer ing with the door
Refrigerator operation		
The compressor does not work	● The refrigerator is in defrosting cycle. ● The refrigerator is not plugged into a power outlet. ● The refrigerator is in OFF state.	● It is normal for an auto matic defrosting refrigerator. ● Verify the plug is plugged in the socket firmly. ● Press the "Power" button for 3 second or more to restart the refrigerator or turn the knob from OFF to temperature selection position.
The fridge storage compartment does not work	● The air door cable is not connected properly. ● The fan does not work ● The fridge storage compartment is turned off	● Check if the air door cable is not connected properly and install it correctly if not so. Verify that th e air door acts normally with the Fridge ON/OFF key on the display panel ● The fan does not work while the refrigeration air door is open. Please check if the door on-off behind the front decoration strip is installed prope rly. Reinstall it correctly if not so. ● Turn on the fridge storage comp artment manually
The refrigerator runs frequently or runs for too long period	● The indoor or outdoor temperature is high ● The refrigerator has been powered off for a period of time. ● The automatic icemaker is operating. ● The door is opened too frequently or for long periods. ● The door of the fridge / freezer storage compartment is not tightly closed. ● The temperature setting for the freezer storage compartment is too low	● In this case, it is normal for the refrigerator to run longer. ● Normally, it takes 8 to 12 hours for the refrigerator to totally cool down. ● Icemaking process makes the refrigerator to run longer. ● Warm air enters the refrigerator and causes it to start frequently. Please do not open the door so frequently. ● Make sure the refrige rator is level place and there is no food or container interfering with the door. ● Set the temperature higher until satisfactory refrigerator temperature is obtained. It takes 24 hours for the refrigerator temperature to become stable.

	● The door gasket of the fridge/freezer storage compartment is dirty, worn, cracked or mismatched. ● The condenser is dirty.	● Clean or replace the door gasket. Leakage g ap of door gasket can cause longer running time of the refrigerator in order to maintain desired temperature. ● Clean the condenser.
Too high temperature		
Too high temperature in the fridge/freezer storage compartment	● The door is opened too frequently or for too long periods of time ● Temperature is set too high ● The door is not closed tightly ● The condenser is dirty	● Warm air will enter the refrigerator whenever the door is opened. Try to open the door as infrequently as possible. ● Reset the temperature. ● Make sure the refrigerator is on a level surface and there is no food or container interfering with the door. ● Clean the condenser.
The temperature in the freezer storage compartment is too high while the temperature in the fridge storage compartment is OK	● The temperature is set too high	● Set the freezer temperature lower. It takes 24 hours for the temperature of the refrigerator to become stable.
The temperature in the fridge storage compartment is too high while the temperature in the freezer storage compartment is OK	● The temperature is set too high	● Set the fridge temperature lower. It takes 24 hours for the temperature of the refrigerator to become stable.
Bad odors in the refrigerator		
The inside of the refrigerator is dirty	● The inside of the refrigerator needs cleaning ● Food with strong odor is stored in the refrigerator	● Clean the internal of the refrigerator ● Wrap the food tightly.
If you hear...		
Beeps	● The fridge storage compartment door is open ● The temperature in the freezer storage compartment is too high	● Close the door or silence the alarm manually ● The alarm is normal when it is first started due to relatively higher temperature.
Abnormal sound	● The refrigerator is not located on a level surface ● The refrigerator touches some object around it	● Adjust the feet to level the refrigerator. ● Remove objects around it.
Slight sound similar to that of flowing water	● It is the sound of the refrigerating system	● Normal.
Heating of cabinet	● The de-dew tube is de-dewing	● It is a process to prevent dewing. It is a normal phenomenon.

Sincere forever

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